THE SOILS OF PRINCE EDWARD ISLAND

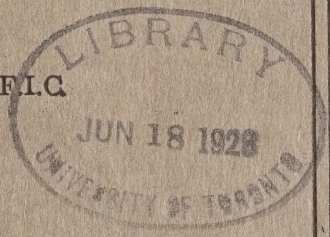
THEIR NATURE AND COMPOSITION

WITH SUGGESTIONS AS TO FERTILIZER TREATMENT

BY

FRANK T. SHUTT, D.Sc., F.I.C.

DOMINION CHEMIST



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THE SOILS OF PRINCE EDWARD ISLAND

THEIR NATURE AND COMPOSITION
WITH SUGGESTIONS AS TO FERTILIZER TREATMENT

Frank T. Shutt, D.Sc., F.I.C.

Dominion Chemist.

Recent reports of the Division of Chemistry have presented data—chemical and physical—of certain soils of Prince Edward Island. These were from samples from the district of Charlottetown, the work being undertaken at the instance of the provincial Department of Agriculture and from a series of soils collected in the East Baltic, Georgetown and North River Districts in connection with field trials for seed production of Brown Top (Rhode Island Bent), a grass now largely used for the making of fine turf, for golf courses, bowling greens, tennis courts and fine lawns.*

The publication of these earlier investigations created a very considerable interest among the farming public of Prince Edward Island and those connected with agricultural activities in the Maritime Provinces generally, and the desire was expressed that a more complete survey of the soils of the province should be made. The growing of certified seed potatoes has recently become one of the most important branches of agriculture in the province and consequently information respecting the economic fertilizer treatment of the soil for this crop becomes a matter of very considerable importance. To obtain this information it was necessary, as a preliminary step, to secure chemical and physical data of soils more generally representative of the province. It was therefore decided to make a further and more extensive collection and the locations of the Illustration Stations were chosen as representing well distributed points for this purpose. This series consisted of 50 samples—surface and subsoil—taken at seventeen points. These samples may be considered as fairly representative of the cultivated soils of the province.

Before presenting the results of the analytical work and conclusions therefrom, the methods of analysis employed may be outlined and the plant food content of average Canadian soils briefly discussed.

* Annual Report, Division of Chemistry, 1925, pp. 4-9 and, 1926, pp. 4-6.

METHODS OF ANALYSIS

Chemical Analysis.—The chemical analysis was made on the air-dried prepared sample, rejecting the portion which did not pass 1·0 mm. mesh sieve.

The tabulated data comprise the "total" constituents as obtained from digestion with 1·115 sp. gr. hydrochloric acid and "available" phosphoric acid and potash from digestion with 1 per cent citric acid solution. Nitrogen determinations were made by the Kjeldahl process and the "Lime Requirement" by the Jones method.

Physical Analysis.—The method of analysis employed was that of the Bureau of Soils, United States Department of Agriculture and furnished seven separates from fine gravel to clay. The data from the mechanical analysis are presented in tabular form.

PLANT FOOD CONTENT OF CANADIAN SOILS

In interpreting the results of soil analysis it must be pointed out that in the present state of our knowledge, there is no possibility of directly and definitely correlating the chemical data with degree of fertility. Chemical analysis in itself does not furnish the evidence for the exact classification of soils as to productiveness. Soil analysis, however, has a practical usefulness in indicating marked characteristics and deficiencies where such exist, and in suggesting appropriate fertilizers and rational methods of soil management; such data have a greater significance in the case of virgin areas than when obtained from cultivated—manured and cropped—soils. Predictions from analyses as to productiveness cannot be of a positive nature—they can only be suggestive and tentative for the plant food content though fundamental and all important, is only one of a large number of ever-changing factors—chemical, biological and physical—influencing and controlling plant growth.

From the statements in the preceding paragraph, it is obvious that rigid "standards of fertility" which could be used in reporting on the relative productiveness of soils cannot be established. Nevertheless, the large number of analyses of Canadian soils made in these laboratories during the past thirty years permit us to make the following statements in respect to the significance to be attached to the essential plant food percentages.

Nitrogen.—The larger number of our good soils contain between ·1 and ·2 per cent though many reach ·5 per cent and some—the richest soils of the western prairies—may exceed 1·0 per cent of nitrogen. Soils containing less than ·1 per cent may prove, under favourable conditions for nitrification, fairly productive, but such generally show a remunerative response to nitrogenous fertilizers. Richness in nitrogen is determined to a large degree by the organic or humus content, though the condition or stage of decomposition of this organic matter is an important factor in indicating the nitrogen's availability.

Phosphoric Acid.—The phosphoric acid in Canadian soils of average fertility usually lies between ·15 and ·25 per cent. Some very good loams contain from ·25 to ·3 per cent and a few exceed the latter figure. The adequacy or otherwise, of phosphoric acid in a soil would appear to depend largely on the accompanying amount of lime. Increased crop production has usually followed the application of phosphatic fertilizers to soils containing less than ·15 per cent phosphoric acid.

In respect to the " available " phosphoric acid, which we already stated has been determined from a 1 per cent citric acid extract of the soil, it may perhaps be assumed that for cereal crops " a percentage as low as ·01 seems to denote an imperative necessity for phosphatic manure, while as much as ·03 would seem to indicate that there is no such immediate necessity " and " for root crops, more especially turnips, the limit would probably be higher ". (Bernard Dyer; Proceedings of the Royal Society, Vol. 35).

Potash.—Our data indicate that good Canadian soils usually possess between ·25 and ·5 per cent of potash; less than ·15 per cent has, in many instances, pointed to the value of potassic fertilizers.

In the case of "available" potash as obtained by the citric acid method, we may tentatively adopt the conclusion of Dr. Dyer (Proceedings of the Royal Society, Vol. 68) that "probably when a soil in the surface depth contains as much as ·01 per cent of citric acid soluble potash, the special application of potassic salts is not needed."

Lime.—Lime ranks next in importance to potash and phosphoric acid in a consideration of the mineral constituents of plant food. It also promotes nitrification, improves tilth and by reason of the alkalinity, is of special value in correcting sour soils. Our experience goes to show, that light and sandy loams containing less than ·25 per cent of lime (CaO) and clay loams less than ·5 per cent will as a rule have their productiveness increased by a dressing of lime in one or other of its agricultural forms. Soils rich in organic matter, such as muck and peaty soils, very frequently respond to an application of lime, and may with advantage be raised to 1 or 1·5 per cent of that element (CaO), especially when supplied in conjunction with phosphoric acid and potash. The continued use of sulphate of ammonia as a nitrogenous fertilizer will call for an occasional application of lime or ground limestone to prevent sourness.

Humus.—Humus or semi-decomposed vegetable matter is to be regarded as the storehouse and guardian of nitrogen, and richness of a soil in the latter important element may be measured to a large degree by the organic or humus content. In reasonable quantities humus has a remarkable influence upon the texture and tilth of the soil. It increases the moisture holding capacity and supports the microscopic life of the soil, which has for its chief function the rendering assimilable of the inert plant food of the soil.

HISTORY AND DESCRIPTION OF SOILS

For conciseness and convenience of reference the particulars of these soils in respect to locality, description and history as gathered at the time of collection, are presented in Table I.

DISCUSSION OF ANALYTICAL DATA

The analytical data, chemical and physical, are presented in Tables II and III, respectively. Their discussion in respect to the general character, fertility and plant food requirements of the soil follows, the soils being considered by counties from East to West.

KINGS COUNTY

Lab'y No. 86751-2: From Souris, Lot 46. This group has been under cultivation for about 50 years and has been unmanured for at least 10 years.

The surface soil would probably rank with loams slightly below medium or average fertility; it has a fair nitrogen content but its percentages of phosphoric acid and potash are somewhat low. The organic matter content for this type of soil is fair, but farm manure or the turning under of green crops is desirable for its maintenance and increase. The "lime requirement" is approximately 2 tons of ground limestone per acre.

The data indicate that applications of a complete fertilizer relatively high in phosphoric acid and potash are desirable and would probably prove very remunerative, especially for potatoes, farm roots and corn.

Lab'y. Nos. 63913-16: From St. Peters, Lot 41. These samples are representative of two areas on the same farm; one (No. 63913) had not received manure for 6 years, the other (No. 63915), for 11 years. It is significant that the latter has the lower nitrogen content. Both are slightly below the average in fertility, judging from the analytical data; they are especially poor in phosphoric acid. The organic matter content is low. The "lime requirement" for both areas is in the neighbourhood of 1 ton of ground limestone per acre. Farm manures, supplemented by applications of a complete fertilizer are suggested by the analysis as desirable for maximum yields.

Lab'y. Nos. 63918-21: From Montague, Lot 52. This group contains soils from two areas on the same farm, both of which had been under cultivation for about 80 years. The area, No. 63918, had been manured one year previous to the collection of the sample, for the potato crop, whereas area No. 63920 had not been manured for a long number of years; the influence of the manure is apparent in the higher percentages of organic matter and nitrogen in the former. The soil from the unmanured area, No. 63920, must be regarded as distinctly poor.

Both areas are decidedly low in phosphoric acid and both show a lime requirement in the neighbourhood of $1\frac{1}{2}$ tons of ground limestone per acre.

Lab'y. Nos. 86753-4: From Caledonia, Lot 61. This soil was taken from a rather gravelly district which was considered poorer than the average farming areas of the province. The land had been under cultivation for about 50 years. It had been manured in the spring of 1926 but there had been no application for twelve years previous. The samples were collected in the autumn of 1926. The analysis does not indicate any special poverty in plant food, which may in some degree perhaps be accounted for by the recent manuring. The lime requirement is about 1 ton ground limestone, per acre.

QUEENS COUNTY

Lab'y. Nos. 86755-6: From Wood Islands, Lot 62. This area it was stated had been under cultivation, chiefly as pasture occasionally seeded down, for 50 years but never manured. The soil was decidedly gravelly and the district was considered as among the poorest in the province.

The analytical data confirm the general impression regarding the low fertility of this soil; its percentages of nitrogen, phosphoric acid and potash are all distinctly below the average found in good productive loams. The acidity of the area points to a lime requirement of about 2 tons ground limestone per acre.

Lab'y. Nos. 63821-26: From Iona, Lot 58. These soils were collected at three points on the same farm. The fields from which they were taken being

adjacent. As a group they are among the "lightest" in the series, i.e., they are very high in sand as compared with silt and clay.

The two groups Nos. 63821-2 and 63823-4 have the same history, having been pastured with an occasional seeding down with oats for about fifty years; there is no record of any application of manure. Both are decidedly poor sandy loams; they are deficient in all three of the essential elements of plant food. No. 63823 is much the poorer of the two, more nearly approaching a " sand " in composition.

No. 63825, cultivated for about fifty years without any application of manure. For ten years—1907-1917—it was continuously in oats, followed by pasture to date of collection of the sample for analysis. In the essential plant food constituents this soil must be regarded as much below the average fertile loams of the province; it is very similar in respect to composition—chemical and mechanical—to soil No. 63821, but is a little poorer in nitrogen and organic matter and somewhat richer in potash. The lime requirement for Nos. 63821 and 63825 is about $1\frac{1}{4}$ tons ground limestone, for No. 63823 it is about $\frac{3}{4}$ ton per acre.

Lab'y. Nos. 86749-50. From Mount Stewart, Lot 37. This loam had been cultivated for about sixty years; in 1925 the land received an application of 24 tons of manure and 200 pounds superphosphate per acre for the potato crop. The sample for analysis was collected to a depth of 6 inches in the autumn of 1926. For a sandy loam of the lighter type it has a fair nitrogen and organic matter content; it is, however, decidedly low in potash. Its lime requirement is about $\frac{3}{4}$ ton ground limestone per acre.

Lab'y. Nos. 63924-27. From Charlottetown, Royalty Lot 32. These are two soils collected on the Experimental Station, situated on the confines of the city of Charlottetown. These have been under cultivation for the past 70-90 years. They are heavier, i.e., contain more clay and silt, than any of the groups previously considered. In respect to organic matter (humus and humus-forming material) and nitrogen they are the richest in the series. Their very satisfactory percentages of these constituents—and particularly those of No. 63924—would place them slightly above the average of good, productive loams. They are, however, decidedly below the best soils in the mineral constituents of plant food and while applications of nitrogen would very probably prove beneficial it might well be concluded from the analytical data that dressings of phosphatic and potassic fertilizers would be specially required for maximum yields. The lime requirement of No. 63924 is approximately 1 ton of ground limestone and that of No. 63926, about 2 tons per acre.

Lab'y. Nos. 63848-51: From Rose Valley. Lot 67. These two soils are from the same farm. It is stated that No. 63848 has been cultivated for the past 80 years, manured and limed in 1911; the cropping has been a rotation: hay, hay, pasture, oats. No. 63850 has been cultivated for 50 years, last manured in 1883. Since 1918 the rotation has been oats, hay, hay, pasture. The area was burnt over 56 years ago.

These are among the heavier soils of the series, which probably explains the fact that they are characterized by a high potash content. They are markedly poor in phosphoric acid. In nitrogen and organic matter No. 63848 is the richer; in this respect it is among the better soils of the present collection. The

lime requirement for No. 63848 is about 1¼ tons of ground limestone and for No. 63850, almost 2 tons, per acre.

Lab'y. Nos. 86757-8: From Rustico, Lot 24. This is among the heavier soils of the series. The results of the chemical analysis would indicate that it is moderately well supplied with plant food. The management of this area in respect to the up-keep of fertility appears to be fairly satisfactory, but undoubtedly yields could be increased by further manuring supplemented by judicious applications of fertilizers. The very low lime requirement, approaching ¾ tons of ground limestone for the surface soil per acre, is very probably the result of the heavy dressing of mussel mud—a material rich in carbonate of lime—twelve years ago.

Lab'y. Nos. 86765-6: From Long River, Lot 20. This area, originally pine and blueberry land, was first cultivated about 60 years ago. It was manured in 1920 at the rate of 18 tons per acre, but has never received any commercial fertilizers. It was "mudded" (mussel mud) many years ago. It contains a little more silt and clay than the lighter members of the series.

This is among the better soils of the collection, the percentages of nitrogen, phosphoric acid and potash placing it with fairly productive loams. The lime requirement is slightly more than ½ tons of ground limestone per acre. The low acidity thus indicated may be ascribed to the previous application of mussel mud referred to above.

PRINCE COUNTY

Lab'y. Nos. 86759-60: From Richmond, Lot 14. This area it is stated has been under cultivation for over 100 years. In 1924 it was manured for the potato crop at the rate of 25-30 tons per acre; it has never received any application of fertilizer but has been "mudded" three times, the last dressing being about 10 years ago.

In silt and clay it lies between the heavier and lighter types of the sandy loams of the province and possesses a relatively large proportion of fine and very fine sand.

In respect to plant food—nitrogen, phosphoric acid and potash—it lies within the limits for productive loams; it is evidently one of the better soils of the series. Its lime-requirement is very low—less than ¼ ton of ground limestone per acre. Again, this slight acidity is in all probability due to the several "muddings" which the area has received.

Lab'y. Nos. 63842-47: From West Devon, Lot 10. All three groups were from the same farm. No. 63842-3, from its percentages of silt and clay, might be placed with the heavier loams of the series. It has been cultivated for more than 50 years and was manured for roots in 1919 at the rate of 25 tons per acre.

This is one of the best soils in the series, judging from its organic content and its percentages of nitrogen, phosphoric acid and potash. Its "lime requirement" would be between 2 and 2½ tons of ground limestone per acre.

The group Nos. 63844-45 represents an area which has been cultivated thirty years. It was manured in 1918 for the potato crop at the rate of 25 tons per acre. This is a fairly light sandy loam underlaid by a very sandy subsoil. With the exception of the phosphoric acid content which is distinctly low, its percentages of plant food are fairly satisfactory. The lime requirement is approximately 1½ tons of ground limestone per acre.

The third of these groups (Nos. 63846-7) was collected from an area originally devoted to cranberry growing. The land was cleared about 30 years ago and had been burnt over. It had never been manured and since 1920 had been in pasture with one crop of oats (1921). The land is subject to flooding and is poorly drained.

This is a difficult group to satisfactorily interpret, chiefly from the fact that the subsoil is richer in organic matter than the surface loam. The probable explanation is that the area being low was of the nature of a bog and in consequence high in vegetable organic matter. This area was burnt over, which it may be supposed would reduce the organic matter to a depth of some inches, and subsequently was covered to some extent by deposit by surface wash from higher lands during flooding. This view obtains support from the greyish colour of the surface soil.

Though fairly rich in nitrogen this soil is characterized by a very low phosphoric acid content and a comparatively low percentage of potash. The lime-requirement is equivalent to approximately 3 tons per acre of ground limestone—one of the highest in the series.

Lab'y. Nos. 86761-2: From O'Leary, Lot 8.—This area has been under cultivation for about 60 years without any application of manure for many years. It was " mudded " 12 years ago. Its cropping since 1920 has been oats and hay.

In nitrogen it is somewhat below the average of the better soils of the series; its percentages of phosphoric acid and potash are fair. The lime-requirement of the surface soil is $\frac{3}{4}$ ton per acre of carbonate of lime.

Lab'y. Nos. 63922-3 and 86763-4: From Palmer Road, Lot 2. The first group (Nos. 63922-3) was collected in 1923. It is from an area which has been under cultivation for about 50 years; it was manured in 1920 at the rate of 25 tons per acre for the potato crop and since that date has been in grain and hay.

Though fair as regards nitrogen and potash it is very low in phosphoric acid. Its lime-requirement is about $1\frac{1}{2}$ tons per acre of ground limestone.

The second group (Nos. 86763-4) was collected in 1926. It had been under cultivation for about 60 years and was manured for the potato crop in 1923 at the rate of 25 tons per acre; grain and hay for the past 3 years.

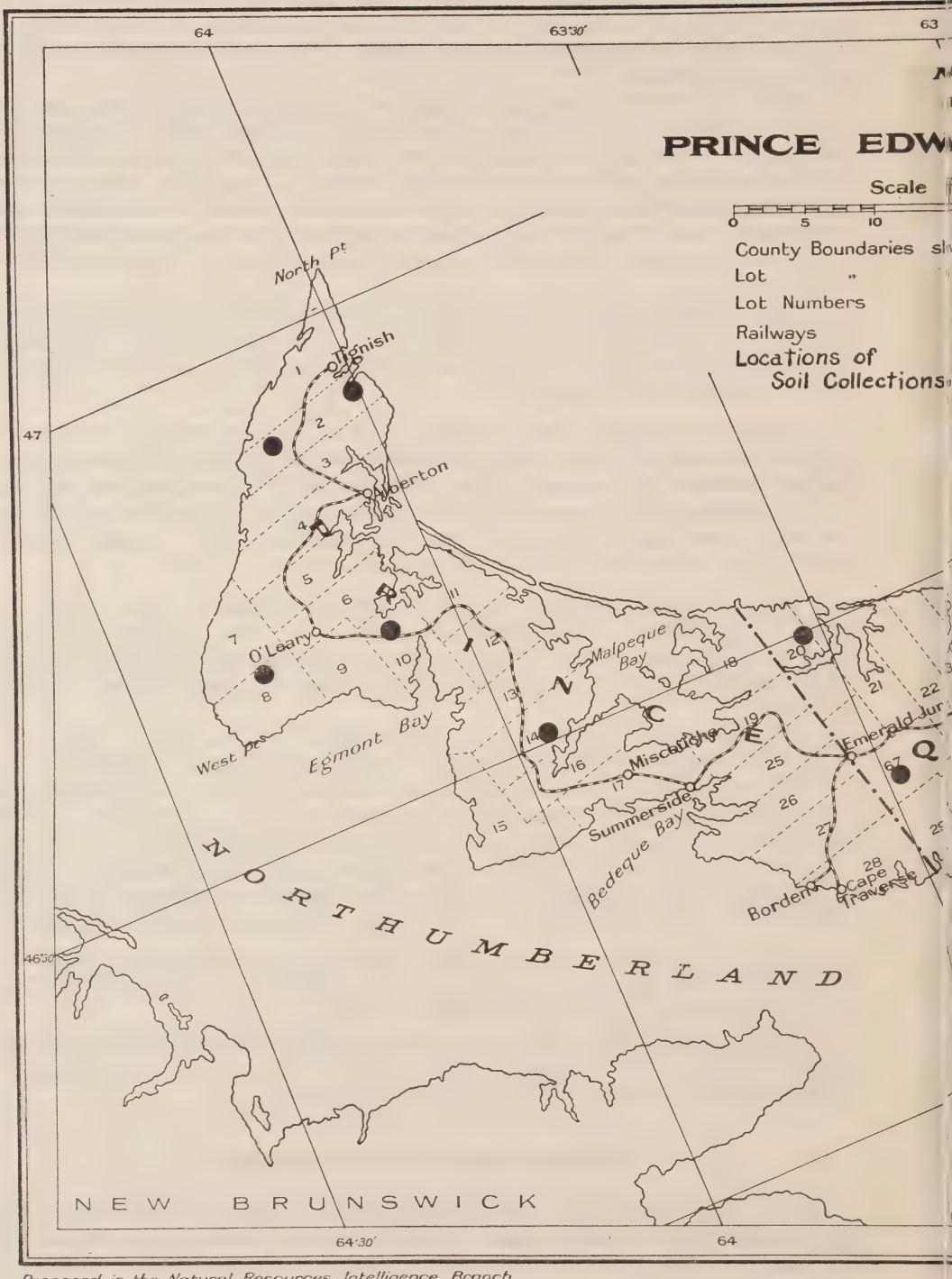
The analytical data show that though slightly below the average in nitrogen, it compares fairly well with the better soils of the series in phosphoric acid and potash. Its lime-requirement is about 2 tons per acre of ground limestone.

Lab'y. Nos. 64196-7: From Tignish, Lot 2.—This soil has been under cultivation for about 70 years. It was manured in 1920 at the rate of 25 tons per acre for potatoes and since borne grain and hay.

The chemical results would show that it is fairly well supplied as to nitrogen and decidedly low in phosphoric acid and potash. Its lime-requirement is approximately $1\frac{1}{2}$ tons per acre of ground limestone.

GENERAL DISCUSSION OF RESULTS

All the soils considered in this investigation are from cultivated areas; there are no soils which would be known technically as virgin, i.e., uncropped and unmanured. The periods of cultivation may be considered long—50 to more than 100 years. High fertility as the result of liberal manuring and the adoption



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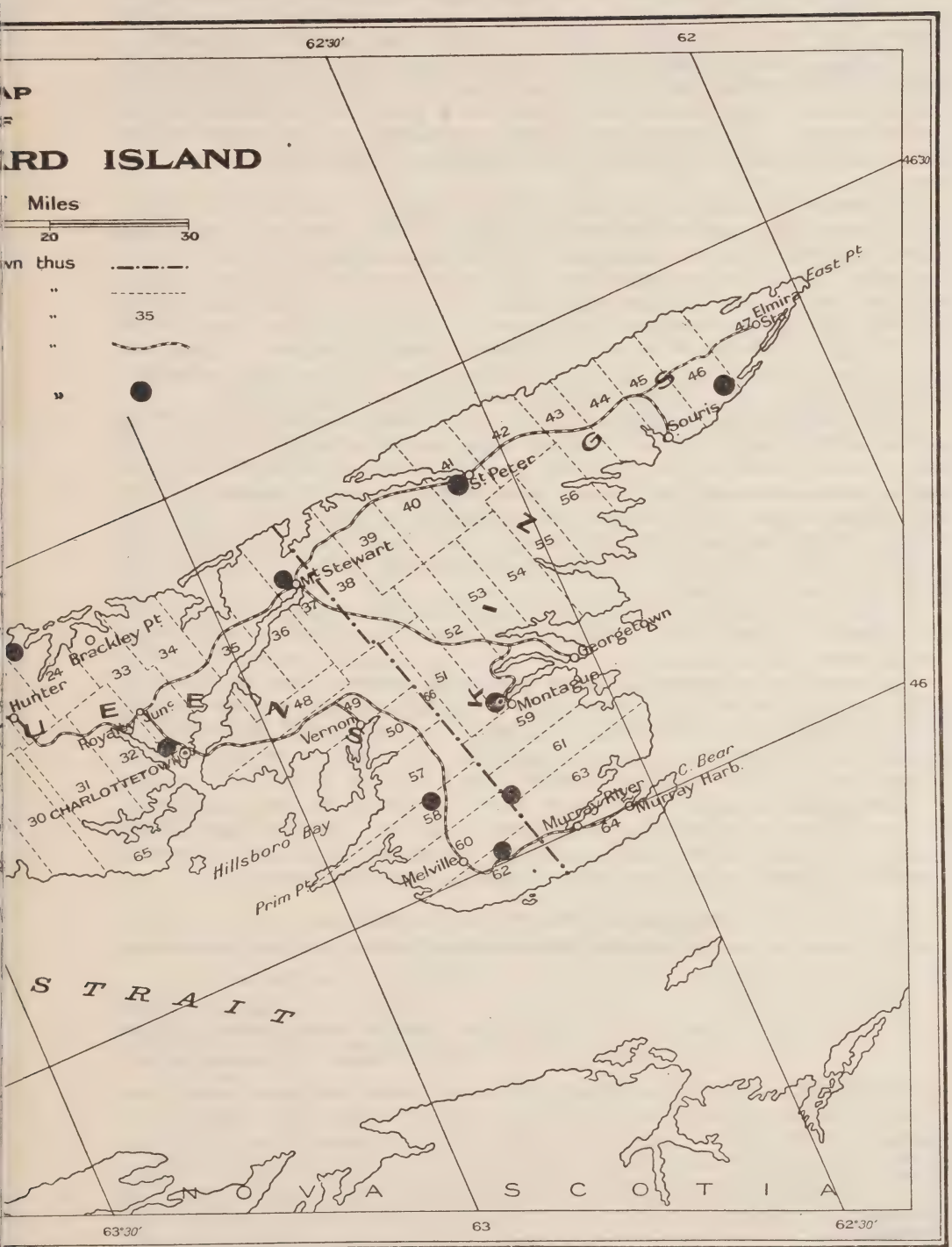
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CHARLOTTETOWN
Hillsboro Bay
Prim Pt
Melville
Murray River
Murray Harb.
C. Bear
STRAIT
NOVA SCOTIA

of a rational rotation (e.g., one including a legume e.g. clover) can scarcely be expected since in the majority of instances the land has merely been seeded down to hay with a grain crop, chiefly oats, with long intervals of pasture.

While no claim is made that all types or classes of soil in the province are included in this series, the points of collection were well distributed over the three counties, Kings Queens and Prince, as a glance at the accompanying map will show.* The series as a whole was considered as fairly representative of the arable lands of the Island by one particularly conversant with its farm lands.

In respect to texture, colour and physical characters generally, the soils of this series are very similar; they are soils for the most part which have been derived from the soft red sandstones and other representatives of the Triassic formation. According to accepted classifications practically all these soils would be classed as " sandy " or " fine sandy loams "; only two or three contain sufficient silt and clay to class them as " loams ". The physical data would show that the lighter soils are to be found in the southeastern portions of Kings and Queens counties and that the heavier loams, i.e., those with the larger proportion of silt and clay, occur in the central and western parts of the province.

From their physical make-up they may be adjudged suitable for a large number of farm crops and with judicial management, including the upkeep of humus-forming material they may be expected to prove excellent soils, with good aeration, warm and with a fair absorptive capacity for moisture. They are such as would readily respond to applications of plant food. They are readily worked and being capable of good tilth would permit of easy root extension. They are underlaid by sub-soils containing more or less gravel, an aid to their natural drainage.

From the standpoint of fertility as measured by chemical analysis, the larger number of these soils are below rather than above the average of productive sandy loams, though only a few could be stated as distinctly poor.

In respect to nitrogen—the most important index of fertility—they no doubt can be improved and this addition of nitrogen, to be economic must be effected by supplying humus-forming material, e.g., by liberal manuring, the turning under of green crops (clover, buckwheat, rye, etc.) and by the adoption of comparatively short rotations in which clover or other legume is a member.

Applications of manure have been made on certain of these soils which have been occasionally broken up and planted to potatoes. In the larger number of such cases the influence of this manuring is apparent in the higher nitrogen content of the soil, as the data in the following table illustrates:—

NITROGEN CONTENT OF SURFACE SOILS

—	Nitrogen	
	Manured within the past 12 years*	Records show no manuring within past 12 years. Some areas apparently never manured**
	p.c.	p.c.
Maximum	·203	·160
Minimum	·135	·040
Average	·167	·104

*15 samples.
** 8 samples.

* The points of collection are indicated on the map on the lots in which the samples were taken, as follows:

In phosphoric acid the surface soils of this series are distinctly low as judged by our tentative standards for Canadian soils; the proportion of this total phosphoric acid which may be considered as more or less immediately available is, however, relatively high—an important feature. A summary of the data follows:—

PHOSPHORIC ACID CONTENT OF SURFACE SOILS

Twenty-five samples	Total	Available
	p.c.	p.c.
Maximum	·177	·069
Minimum	·054	·014
Average	·106	·034

It is evident from these results that phosphoric acid is necessary for optimum yields and the experience of users of commercial fertilizers has proved that the arable soils in general of the province will profitably respond to applications of this element of plant food.

The tentative standards which have been adopted in respect to potash would indicate that the large number of the soils of this series are below the average; only a few come within the limits recognized for good productive loams. Here, again, however, it is to be noticed that the relative availability is high, so that in some measure the deficiency in "total" potash is compensated for by a more ready availabilty. A summary of the potash data may be given as follows:—

POTASH CONTENT OF SURFACE SOILS

Twenty-five samples	Total	Available
	p.c.	p.c.
Maximum	·366	·018
Minimum	·092	·006
Average	·192	·013

In considering a desirable fertilizer for the potato crop, a formula showing not less than 6 per cent of potash is recommended.

The whole series is characterized by a low lime content—too low for best results, whether the matter is considered from the chemical, biological or physical point of view. For optimum yields of most farm crops an application of lime in some form would appear to be necessary.

Contrary to what might have been expected the surface soil (the upper 6 or 7 inches) has a much higher percentage of lime than the subsoil, which in some instances at least, may be accounted for by past applications of mussel mud. Thus, in the case of No. 3, 86759-60, from Richmond, Lot 14, an area which had been mudded ten years previous to the collection of the sample and several times (at least twice) before that date, the percentages of lime are the highest in the list, .419 and .266 respectively for surface and subsoil. The following table presents a summary of the lime data.

LIME CONTENT OF SOILS

(Surface and Subsoils)

Twenty-five samples	Surface	Subsoil
	p.c.	p.c.
Maximum	·419	·266
Minimum	·028	·028
Average	·160	·085

The results for lime are supported by the lime-requirement data and the pH values. The former indicate the desirability of the application of from 1 to 2 tons of ground limestone per acre and the latter is to be regarded as signifying a moderate degree of acidity.

It is interesting to note that there is a general agreement between the data for lime, lime requirement and degree of acidity as measured by the pH values.

Since the potato crop is one of special interest and value to the farmers of this province, it should be stated that the potato plant tolerates a moderate acidity and flourishes in soils with an acid reaction of pH 4·8-5·7. It is within these limits that the larger number of the soils of this series fall. As it has been definitely established that an alkaline soil favours the development of potato scab, it is clear that dressings of lime, ground limestone or mussel mud are neither necessary nor desirable for this crop. If lime as an element of plant food is thought necessary for the potato crop it may be furnished in the form of sulphate of lime as found in superphosphate or in land plaster, neither of which materials will reduce the acidity of the soil.

Since in the economic upkeep of these soils clover should be a member of the rotation and since clover will thrive only in soils with a fair lime content, the question presents itself as to the best way in which this element may be supplied, having in mind the use of the land at a later date for the potato crop. It is suggested that if applications of ground limestone or mussel mud are thought necessary for the encouragement of the clover that they should be made at moderate rates and as far removed in the rotation as may be practicable from the potato crop.

It is significant that in both surface and sub-soils the percentage of magnesia, though not large, always exceeds that of the lime—a condition which according to certain agricultural authorities, is not favourable to optimum growth. Though apparently there is no evidence on record to support this view in respect to Prince Edward Island soils, the addition of lime—more especially from high calcium limestone—would seem to be prompted.

CONCLUSIONS

The results in general from this investigation would suggest for the maintenance and increase of the fertility of these soils: (1) the addition of humus-forming material as furnished by the application of farm manures, the turning under of green crops, e.g., buckwheat, rye and clover and the adoption of comparatively short rotations in which clover or other legume is a member; (2) for crops other than potatoes, the application of ground limestone or other lime-bearing material to correct acidity and furnish lime for crop use; (3) the supplementing of the plant food constituents furnished by the manure and in the crop residues, by the rational use of fertilizers. In the majority of cases a

complete fertilizer should undoubtedly be used, the formula to be adjusted from a consideration of the past manuring and cropping of the soil and the special requirements of the crop to be grown. The results of this investigation and of the experimental work with fertilizers carried on in the province during the past ten years suggest the following recommendations respecting fertilizer formulae for the potato crop.

FERTILIZER FORMULAE SUGGESTED FOR THE POTATO CROP

(On average sandy loam)

Previous treatment of soil	Fertilizer materials in pounds per acre				Equivalent (approximately) to
	Nitrate of soda	Sulphate of ammonia	Super-phosphate	Muriate of potash	
Clover sod liberally manured..	100	.....	325	60	500 lb. of 3-10-6.
Small dressing of manure.....	100	80	400	100	800 lb. of 4-8-6.
Clover sod—no manure.....	100	80	500	160	1,000 lb. of 3-8-8.
No clover or manure.....	150	120	600	190	1,200 lb. of 4-8-8.

On heavier loams the potash might be reduced; on very light sandy loams it might be increased with profitable results.

While the above recommendations will meet the requirements of this crop in ordinary farm practice, it may be added that in districts devoted particularly to potato growing and where fertilizers are relied upon to furnish the greater part of the plant food, amounts as high as 1,500 to 2,000 pounds per acre may give profitable returns.

TABLE I.—PRINCE EDWARD ISLAND SOILS—COLLECTED FROM THE ILLUSTRATION STATIONS—HISTORY AND DESCRIPTION

Lab'y. No.	Date of collection	Locality	Surface or subsoil	Description	Manuring and cropping
				Kings County	
86751	1926	Souris, Lot 46	Surface 0-7″	Brownish red sandy loam	Cultivated 50 years, unmanured for at least ten years. Drainage, good. Cropping: 1922-24, pasture; 1925, oats; 1926, pasture.
86752	1926	" 46	Subsoil 7-14″		
63913	1923	St. Peters, Lot 41	Surface 0-7″	Brownish-red sandy loam	Cultivated 100 years, manured 17 tons per acre in 1917; drainage, good; cropping: 1918, potatoes and roots; 1919, wheat; 1920-22, hay.
63914	1923	" 41	Subsoil 7-14″		
63915	1923	" 41	Surface 0-7″	Brownish-red sandy loam	Cultivated 45 years, manured 17 tons per acre in 1912; drainage, good; cropping: 1917, pasture; 1918, oats; 1919-20, hay; 1921-22, pasture.
63916	1923	" 41	Subsoil 7-14″		
63918	1923	Montague, Lot 52	Surface 0-7″	Brownish-red sandy loam	Cultivated 80 years, manured 12 tons per acre in 1922. Drainage, good; cropping: 1918-19, hay; 1920, pasture; 1921, oats; 1922, potatoes.
63919	1923	" 52	Subsoil 7-14″		
63920	1923	" 52	Surface 0-7″	Brownish-red sandy loam	Cultivated 80 years, unmanured; drainage, good; cropping: 1918-19, pasture; 1920, oats; 1921-22 pasture.
63921	1923	" 52	Subsoil 7-14″		
86753	1926	Caledonia, Lot 61	Surface 0-7″	Brownish-red sandy loam	Cultivated 50 years, manured 7 tons per acre in 1926, no manure for 12 years previous; drainage, good; cropping: 1922, hay; 1923, mixed feed; 1924-25, hay; 1926, mixed feed.
86754	1926	" 61	Subsoil 7-14″		
				Queens County	
86755	1926	Wood Islands, Lot 62	Surface 0-7″	Brownish-red light sandy loam.	Cultivated 50 years, never manured; drainage, good; cropping: 1922-24, pasture; 1925, oats; 1926, sheep pasture.
86756	1926	" 62	Subsoil 7-14″		
63821	1923	Iona, Lot 58	Surface 0-7″	Brownish-red sandy loam	Cultivated 50 years, no recollection by owner, of this area having been manured. Drainage, good. Cropping: 1913-17, pasture; 1918, oats; 1919-21, pasture; 1922, oats.
63822	1923	" 58	Subsoil 7-14″		
63823	1923	" 58	Surface 0-7″	" "	
63824	1923	" 58	Subsoil 7-14″		
63825	1923	" 58	Surface 0-7″	Brownish-red sandy loam	Cultivated 50 years, unmanured; drainage, good. Cropping: 1907-17, oats; 1918-22 pasture.
63826	1923	" 58	Subsoil 7-14″		
86749	1926	Mount Stewart, Lot 37	Surface 0-6″	Brownish-red sandy loam	Cultivated 60 years, manured 24 tons per acre and 200 pounds of superphosphate, per acre, in 1925. Drainage, good. Cropping: 1922-23, hay; 1924, pasture; 1925, potatoes; 1926, wheat.
86750	1926	" 37	Subsoil 6-13″		
63924	1923	Charlottetown, Lot 32	Surface 0-7″	Brownish-red sandy loam	Cultivated 80 years, manured 30 tons per acre in 1918; drainage, poor. Cropping: several years previous to 1918, pasture; 1918, turnips; 1919, mixed feed; 1920-21, pasture; 1922, mixed grain.
63925	1923	" 32	Subsoil 7-14″		
63926	1923	" 32	Surface 0-7″	Brownish-red sandy loam	Cultivated 70 years; manured, in 1918 and 1919 at 15 tons per acre. Comm. fertilizers at 800 lb. per acre in 1917 and 1920. Drainage, good. Cropping: 1897-1917, pasture; 1917-20, roots; 1921, oats; 1922, clover hay.
63927	1923	" 32	Subsoil 7-14″		
63848	1923	Rose Valley, Lot 67	Surface 0-7″	Brownish-red sandy loam	Cultivated 80 years, manured and limed in 1911. Drainage, good. Cropping: 1918, oats; 1919-20, hay; 1921, pasture; 1922, oats.
63849	1923	" 67	Subsoil 7-14″		

63850	1923	" 67.....	Surface 0-6".....	Brownish-red sandy loam...	Cultivated 50 years, unmanured since 1883; drainage, good; cropping:
63851	1923	" 67.....	Subsoil 6-12"....		1918, oats; 1919-20, hay; 1921, pasture; 1922, oats.
86757	1926	Rustico, lot 24.....	Surface 0-6".....	Brownish-red sandy loam...	Cultivated 60 years, manured 20 tons per acre in 1921. Mussel mud
86758	1926	" 24.....	Subsoil 6-13"....		applied 12 years previous; drainage good. Cropping: 1921, potatoes; 1922, barley; 1923, clover hay; 1924-25, hay; 1926, pasture.
86765	1926	Long River, Lot 20.....	Surface 0-7".....	Brownish-red sandy loam...	Cultivated 60 years, originally pine and blueberry land. Manured
86766	1926	" 20.....	Subsoil 7-14"....		18 tons per acre in 1920. Drainage, good. Cropping: 1920, potatoes; 1921, grain; 1922-23, hay; 1924-25, pasture; 1926, oats.
				Prince County	
86759	1926	Richmond, Lot 14.....	Surface 0-6".....	Brownish-red sandy loam...	Cultivated 100 years, manured 25 tons per acre in 1924, mussel mud
86760	1926	" 14.....	Subsoil 6-13"....		applied 10 years ago and twice before that date. Drainage, good. Cropping: 1921-22, hay; 1923, pasture; 1924, potatoes; 1925, oats; 1926, hay.
63842	1923	West Devon, Lot 10.....	Surface 0-7".....	Brownish-red sandy loam...	Cultivated 50 years, manured 25 tons per acre in 1919. Drainage,
63843	1923	" 10.....	Subsoil 7-14"....		good. Cropping: 1918, pasture; 1919, roots; 1920, wheat; 1921-2 hay.
63844	1923	" 10.....	Surface 0-7".....	Brownish-red sandy loam...	Cultivated 30 years, manured 25 tons per acre in 1918; drainage, good;
63845	1923	" 10.....	Subsoil 7-14"....		cropping: 1918, potatoes; 1919, wheat; 1920-21, hay; 1922, pasture
63846	1923	" 10.....	Surface 0-8".....	Greyish-brown sandy loam.	Cultivated intermittently over 30 years, unmanured, drainage, poor;
63847	1923	" 10.....	Subsoil 8-16"....		land flooded at times, originally cranberry land; cropping: 1918-20, pasture; 1921, oats; 1922, yellow weeds. Land burnt over.
86761	1923	O'Leary, Lot 8.....	Surface 0-6".....	Brownish-red sandy loam...	Cultivated 60 years, unmanured for a good many years. Mussel
86762	1923	" 8.....	Subsoil 6-13"....		mud applied 10 or 12 years ago. Drainage, good. Cropping: 1922, oats; 1923-4, hay; 1925-26, oats.
63922	1923	Palmer Road, Lot 2.....	Surface 0-7".....	Brownish-red sandy loam...	Cultivated 50 years. Manured 25 tons per acre in 1920. Drainage,
63923	1923	" 2.....	Subsoil 7-14"....		good. Cropping: 1918-19, pasture; 1920, potatoes; 1921, wheat; 1922, hay..
86763	1926	"	Surface 0-7".....	Brownish-red sandy loam...	Cultivated 60 years; manured 25 tons per acre in 1923; drainage, good;
86764	1926	"	Subsoil 7-14"....		Cropping: 1922, hay; 1923, potatoes; 1924, wheat; 1925, clover hay; 1926, hay.
64196	1923	Tignish, Lot 2.....	Surface 0-7".....	Brownish-red sandy loam...	Cultivated 70 years. Manured in 1920 at 25 tons per acre. Drainage,
64197	1923	" 2.....	Subsoil 7-14"....		poor. Cropping: 1918-19, pasture; 1920, potatoes; 1921, wheat; 1922, hay.

TABLE 2—PRINCE EDWARD ISLAND SOILS—COLLECTED FROM THE ILLUSTRATION STATIONS OF P.E.I.—CHEMICAL ANALYSES

Lab'y No.	Locality	Surface or Subsoil	Moisture	Moisture-free Basis											Lime Requirement		pH Value
				Loss on Ignition (Organic Matter etc.)	Insoluble Mineral Matter	Oxide of Iron and Alumina (Fe_2O_3 +Al_2O_3)	Lime (CaO)	Magnesia (MgO)	Nitrogen (N)	Phosphoric Acid (P_2O_5)		Potash (K_2O)		Pounds per Acre		
										Total	Available	Total	Available	Carbonate of Lime ($CaCO_3$)	Quick Lime (CaO)	
			p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
	Kings County															
86751	Souris, Lot 46	Surface	1·50	5·67	89·71	4·16	0·078	0·387	0·160	0·121	0·035	0·185	0·013	4,120	2,300	5·14
86752	" 46	Subsoil	1·40	3·63	90·50	4·74	0·043	0·462	0·093	0·168	0·043	0·214	0·012	4,120	2,300	5·12
63913	St. Peters, Lot 41	Surface	1·02	4·74	90·03	4·06	0·136	0·259	0·156	0·102	0·034	0·159	0·012	2,060	1,150	5·51
63914	" 41	Subsoil	0·91	2·82	90·76	5·29	0·082	0·523	0·063	0·110	0·057	0·216	0·011	1,600	900	5·34
63915	" 41	Surface	1·17	4·73	89·60	4·50	0·181	0·324	0·138	0·100	0·034	0·204	0·011	1,340	770	5·88
63916	" 41	Subsoil	1·11	3·49	89·69	5·80	0·092	0·453	0·077	0·132	0·067	0·259	0·012	2,250	1,260	5·15
63918	Montague, Lot 52	Surface	1·12	5·12	89·66	4·26	0·137	0·284	0·160	0·098	0·029	0·177	0·014	2,980	1,670	5·36
63919	" 52	Subsoil	1·17	3·51	89·54	5·90	0·055	0·405	0·089	0·102	0·043	0·235	0·011	2,980	1,670	5·00
63920	" 52	Surface	1·24	3·51	92·51	3·56	0·109	0·362	0·104	0·054	0·014	0·204	0·013	2,520	1,410	4·90
63921	" 52	Subsoil	0·71	3·31	90·76	4·86	0·064	0·457	0·082	0·055	0·018	0·236	0·008	3,890	2,180	4·56
86753	Caledonia, Lot 61	Surface	1·45	5·84	89·90	4·04	0·199	0·284	0·164	0·132	0·039	0·156	0·016	1,860	1,040	6·36
86754	" 61	Subsoil	1·30	3·93	90·92	4·71	0·082	0·372	0·083	0·131	0·057	0·191	0·015	2,310	1,290	5·93
	Queens County															
86755	Wood Islands, Lot 62	Surface	1·03	4·17	92·75	3·36	0·028	0·215	0·089	0·096	0·031	0·109	0·015	3,660	2,050	5·14
86756	" 62	Subsoil	1·40	3·63	91·55	4·51	0·028	0·287	0·066	0·120	0·032	0·141	0·013	4,560	2,560	5·04
63821	Iona, Lot 58	Surface	0·84	3·62	91·49	4·02	0·044	0·229	0·091	0·076	0·038	0·134	0·010	2,750	1,540	4·91
63822	" 58	Subsoil	0·97	2·94	90·59	5·25	0·044	0·277	0·071	0·071	0·056	0·203	0·011	2,520	1,410	5·12
63823	" 58	Surface	0·50	2·39	94·32	2·57	0·051	0·151	0·040	0·075	0·032	0·094	0·014	1,600	900	5·41
63824	" 58	Subsoil	0·16	0·75	97·66	1·33	0·044	0·044	0·020	0·029	0·019	0·069	0·008	690	390	5·29
63825	" 58	Surface	0·94	3·07	90·74	4·53	0·037	0·202	0·086	0·084	0·020	0·199	0·013	2,520	1,410	5·17
63826	" 58	Subsoil	1·19	3·93	88·84	6·52	0·045	0·417	0·056	0·086	0·024	0·244	0·009	2,250	1,260	5·17
86749	Mount Stewart, Lot 37	Surface	1·33	5·07	90·40	3·69	0·117	0·328	0·163	0·137	0·036	0·150	0·018	2,760	1,550	5·44
86750	" 37	Subsoil	1·44	3·29	90·24	5·50	0·060	0·492	0·072	0·097	0·027	0·185	0·012	2,310	1,290	5·32
63924	Charlottetown, Lot 32	Surface	1·65	7·51	84·86	6·15	0·309	0·453	0·254	0·116	0·035	0·142	0·010	2,060	1,150	5·73
63925	" 32	Subsoil	1·14	4·15	86·66	7·34	0·125	0·647	0·097	0·073	0·033	0·155	0·010	2,750	1,550	5·26
63926	" 32	Surface	1·47	6·78	86·70	5·32	0·120	0·303	0·202	0·111	0·035	0·092	0·012	4,350	2,440	4·80
63927	" 32	Subsoil	1·70	5·80	85·53	7·70	0·102	0·455	0·141	0·136	0·059	0·126	0·011	3,890	2,180	5·07
63848	Rose Valley, Lot 67	Surface	1·30	5·46	86·06	7·17	0·212	0·727	0·180	0·092	0·028	0·366	0·014	2,570	1,440	5·56
63849	" 67	Subsoil	1·57	3·84	84·84	9·31	0·062	1·11	0·075	0·099	0·050	0·375	0·015	4,820	2,700	4·66
63850	" 67	Surface	1·26	4·92	88·59	5·43	0·058	0·399	0·130	0·072	0·026	0·237	0·013	3,850	2,160	4·71
63851	" 67	Subsoil	1·92	5·18	85·43	8·33	0·065	0·616	0·109	0·135	0·086	0·334	0·011	5,780	3,240	4·69
86757	Rustico, Lot 24	Surface	1·65	5·78	88·42	4·92	0·281	0·475	0·164	0·134	0·038	0·211	0·011	1,340	760	6·39
86758	" 24	Subsoil	1·63	5·18	86·53	7·04	0·116	0·650	0·106	0·225	0·118	0·278	0·012	4,560	2,560	5·12
86765	Long River, Lot 20	Surface	1·28	5·47	87·42	6·05	0·227	0·649	0·170	0·145	0·038	0·267	0·012	1,340	760	6·44
86766	" 20	Subsoil	1·23	3·47	88·29	7·02	0·163	0·790	0·073	0·158	0·047	0·327	0·011	1,340	760	6·26
	Prince County															
86759	Richmond, Lot 14	Surface	1·73	5·88	86·08	6·53	0·419	0·750	0·173	0·177	0·069	0·234	0·012	450	260	7·01
86760	" 14	Subsoil	1·70	4·66	86·61	7·41	0·266	0·935	0·096	0·228	0·107	0·261	0·011	920	520	6·49
63842	West Devon, Lot 10	Surface	1·83	7·26	84·80	6·78	0·165	0·654	0·203	0·122	0·035	0·238	0·017	4,500	2,520	5·05
63843	" 10	Subsoil	1·77	5·31	83·52	8·96	0·075	1·17	0·102	0·113	0·055	0·334	0·011	5,140	2,880	4·75
63844	" 10	Surface	1·84	5·89	86·76	6·20	0·172	0·587	0·165	0·099	0·036	0·200	0·017	3,210	1,800	5·41
63845	" 10	Subsoil	1·52	4·55	85·45	8·40	0·072	0·873	0·108	0·113	0·050	0·261	0·008	3,850	2,160	5·02
63846	" 10	Surface	1·47	6·87	89·45	3·03	0·164	0·315	0·189	0·061	0·021	0·143	0·013	5,780	3,240	4·83

63847	" 10	Subsoil	3·98	10·84	79·49	8·67	0·048	0·699	0·172	0·059	0·031	0·217	0·008	9,950	5,580	4·51
86761	O'Leary, Lot 8	Surface	1,70	5·95	86·97	5·94	0·284	0·534	0·131	0·131	0·032	0·211	0·008	1,600	900	5·92
86762	" 8	Subsoil	1·85	5·25	84·79	8·47	0·099	0·830	0·087	0·201	0·058	0·280	0·011	5,420	3,600	4·80
63922	Palmer Road, Lot 2	Surface	1·27	5·82	88·35	5·36	0·206	0·625	0·173	0·081	0·029	0·252	0·003	2,980	1,680	5·24
63923	" 2	Subsoil	1·44	3·49	89·76	5·92	0·124	0·788	0·074	0·070	0·036	0·250	0·008	2,750	1,550	5·00
86763	" 2	Surface	1·23	5·14	88·13	5·47	0·092	0·651	0·135	0·139	0·036	0·275	0·017	4,120	2,300	4·95
86764	" 2	Subsoil	0·83	3·44	89·84	6·22	0·057	0·855	0·064	0·187	0·041	0·297	0·015	4,120	2,300	4·78
64196	Tignish, Lot 2	Surface	1·09	5·88	87·42	5·92	0·184	0·626	0·167	0·090	0·041	0·167	0·014	2,980	1,680	5·15
64197	" 2	Subsoil	0·76	3·64	87·48	7·74	0·116	1·15	0·069	0·070	0·041	0·237	0·012	3,890	2,180	4·75

TABLE 3.—PRINCE EDWARD ISLAND SOILS—COLLECTED FROM THE ILLUSTRATION STATIONS OF P.E.I.—MECHANICAL ANALYSIS—ON MOISTURE-FREE BASIS

Lab'y. No.	Locality	Surface or subsoil	Stones, rock fragments, percentage left or 2 mm. sieve	Fine gravel 2-1 mm	Coarse sand 1—·5 mm.	Medium sand ·5—·25 mm.	Fine sand ·25—·1 mm.	Very fine sand ·1—·05 mm.	Total sand	Silt ·05—·005 mm.	Clay ·005—·00 mm.	Classification
	Kings County	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.			
86751	Souris, Lot 46	Surface...	nil	0·97	1·65	8·25	39·21	21·50	71·40	19·92	8·68	Sandy loam.
86752	"	Subsoil...	"	1·86	2·32	7·52	39·88	18·70	70·28	18·46	11·26	"
63913	St. Peters, Lot 41	Surface...	0·18	1·46	2·07	7·11	40·75	20·66	72·05	19·08	8·87	"
63914	"	Subsoil...	1·16	1·61	2·61	7·89	37·89	22·86	72·86	19·27	7·87	"
63915	"	Surface...	0·95	1·56	2·08	8·45	39·28	18·99	70·36	20·10	9·54	"
63916	"	Subsoil...	0·92	1·45	2·30	8·55	38·88	18·98	70·16	19·21	10·63	"
63918	Montague, Lot 52	Surface...	0·09	1·73	3·93	14·16	32·77	17·56	70·15	20·28	9·57	"
63919	"	Subsoil...	0·28	1·91	4·24	13·31	30·43	19·48	69·37	21·45	9·18	"
63920	"	Surface...	0·45	0·74	2·48	8·67	29·21	24·48	65·58	24·74	9·68	"
63921	"	Subsoil...	0·92	1·63	2·96	9·03	29·29	22·26	65·17	24·78	10·05	"
86753	Caledonia, Lot 61	Surface...	6·28	1·17	4·97	16·19	38·00	12·38	72·71	17·32	9·97	"
86754	"	Subsoil...	10·43	1·79	5·84	18·22	37·03	12·45	75·33	15·30	9·37	"
	Queens County											
86755	Wood Islands, Lot 62	Surface...	2·75	4·06	12·38	19·33	30·36	13·23	79·36	13·46	7·18	Sand.
86756	"	Subsoil...	3·62	4·57	12·45	18·65	29·26	12·20	77·13	12·82	10·05	Sandy loam.
63821	Iona, Lot 58	Surface...	1·88	1·45	6·77	22·26	35·56	11·05	77·09	14·59	8·32	Sandy loam, nearly sand.
63822	"	Subsoil...	3·00	0·99	6·83	21·93	36·59	11·15	77·49	14·43	8·08	" "
63823	"	Surface...	1·42	0·86	5·11	24·47	45·00	9·70	85·14	9·62	5·24	Sand.
63824*	"	Subsoil...	.....	.....	5·95	29·47	44·69	8·36	88·47	8·15	3·38	"
63825	"	Surface...	0·80	1·32	5·57	19·37	36·31	11·80	74·37	16·86	8·77	Sandy loam.
63826	"	Subsoil...	0·61	1·13	5·25	17·70	33·56	13·29	70·93	18·81	10·26	"
86749	Mount Stewart Lot 37	Surface...	0·063	1·95	1·79	6·86	42·45	19·81	72·86	17·72	9·42	"
86750	"	Subsoil...	nil	2·97	3·11	8·10	39·79	20·64	74·61	17·44	7·95	"

TABLE 3—PRINCE EDWARD ISLAND SOILS—COLLECTED FROM THE ILLUSTRATION STATIONS OF P.E.I.—MECHANICAL ANALYSIS—ON MOISTURE-FREE BASIS—*Concluded*

Lab'y. No.	Locality	Surface or subsoil	Stones, rock fragments, percentage left or 2 mm. sieve	Fine gravel 2-1 mm	Coarse sand 1--5 mm.	Medium sand ·5--25 mm.	Fine snad ·25--1 mm. mm.	VCry fine sand ·1--05	Total sand	Silt ·05--005 mm.	Clay ·005--00 mm.	Classification
		p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.			
	Queen's County											
63924	Charlottetown, Lot 32	Surface...	2·22	1·86	1·20	2·45	23·59	28·69	57·79	29·35	12·86	"
63925	"	Subsoil...	nil	2·00	1·89	2·62	24·30	30·03	60·84	27·93	11·23	"
63926	"	Surface...	0·63	1·17	1·17	2·96	29·08	28·23	62·61	24·45	12·94	"
63927	"	Subsoil...	0·34	3·20	3·13	3·19	27·49	28·30	65·31	25·00	9·69	"
63848	Rose Valley Lot 67	Surface...	0·23	1·01	1·46	2·17	17·44	28·58	50·66	34·75	14·59	" , nearly loam.
63849	"	Subsoil...	3·13	0·66	1·32	1·52	10·79	28·51	42·80	38·80	18·40	Loam.
63850	"	Surface...	0·25	1·43	1·57	3·21	33·72	31·56	71·49	18·65	9·86	Sandy loam.
63851	"	Subsoil...	0·74	1·76	1·76	4·14	25·54	32·84	66·04	21·12	12·84	"
86757	Rustico, Lot 24	Surface...	nil	0·76	0·77	2·45	34·00	26·42	64·40	24·47	11·13	"
86758	"	Subsoil...	"	0·73	1·49	3·49	29·59	25·02	60·32	25·78	13·90	"
86765	Long River, Lot 20	Surface...	0·01	0·27	1·31	9·10	38·73	20·22	69·63	18·75	11·62	"
86766	"	Subsoil...	nil	0·97	1·82	9·07	42·56	20·36	74·78	15·91	9·31	"
	Prince County											
86759	Richmond, Lot 14	Surface...	nil	1·00	1·41	5·19	41·10	21·94	70·64	18·64	10·72	"
86760	"	Subsoil...	0·061	0·70	1·55	5·34	42·84	22·11	72·54	17·30	10·16	"
63842	West Devon, Lot 10	Surface...	0·39	0·53	0·88	3·33	29·47	32·12	66·33	20·88	12·79	"
63843	"	Subsoil...	0·01	0·23	0·75	2·38	25·12	39·18	67·66	19·81	12·53	"
63844	"	Surface...	0·84	1·27	2·11	5·41	49·88	15·71	74·38	15·24	10·38	"
63845	"	Subsoil...	2·00	2·83	3·39	5·02	51·04	15·99	78·27	12·12	9·61	" , nearly sand.
63846	"	Surface...	0·31	0·72	1·02	4·34	37·76	25·29	69·13	19·20	11·67	"
63847	"	Subsoil...	2·78	1·64	1·12	5·50	39·16	21·86	69·28	13·20	17·52	"
86761	O'Leary, Lot 8	Surface...	0·121	0·51	1·62	6·17	21·95	32·42	62·67	24·39	12·94	"
86762	"	Subsoil...	0·021	0·63	1·14	4·13	20·12	37·74	63·76	22·88	13·36	"
63922	Palmer Road, Lot 2	Surface...	2·00	2·00	2·08	6·40	29·22	21·53	61·23	26·00	12·77	"
63923	"	Subsoil...	3·20	1·90	2·13	6·68	32·32	25·52	68·55	21·41	10·04	"
86763	"	Surface...	3·50	2·01	1·99	6·46	28·30	21·35	60·11	25·28	14·61	"
86764	"	Subsoil...	2·52	1·79	2·24	6·67	33·20	23·00	66·90	19·86	13·24	"
64196	Tignish, Lot 2	Surface...	1·65	1·59	2·15	6·39	28·93	21·21	60·27	25·78	13·95	"
64197	"	Subsoil...	2·96	1·72	2·44	7·96	30·54	21·25	63·91	22·44	13·65	"

*The data for this sample are from the soil passing a 1 mm. sieve.

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